

# UNITED STATES PATENT OFFICE.

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## AEROPLANE.

1,027,954.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, JOSEPH A. WILLIAMS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Aeroplanes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates generally to air ships of the aeroplane type, and it has special reference to the shape of the plane used in such ships.

Heretofore, designers and builders of aeroplanes have generally proceeded on the theory of beating one or more inclined planes against the air, relying upon the vertical component of the resisting force encountered for lifting the air ship. In my invention, I may utilize to some extent the same principle, but I secure the main part of the lifting and sustaining action by so shaping the plane as to create a partial vacuum over the upper surface of the plane whereby the atmospheric pressure from beneath buoys up the ship.

The object of my invention, therefore, is the production of a plane that is so shaped that the movement of the plane through the air, or the movement of the air past the plane, results in creating a difference in pressure above and below the plane, whereby the ship is lifted and sustained. More specifically stated, I form the plane in the general shape of a trough having an open top and having the front end narrowed, so that the air entering the front end of the trough is rarefied as it expands to fill the wider parts of the trough. Of course, the air rushes in to establish equilibrium of pressure, and the variation in pressure diminishes toward the rear end of the plane. To retard the influx of the air as much as practicable, I provide the trough with considerable depth even at its front end, and gradually increase the depth toward the rear end.

In the drawings forming a part of this application, Figure 1 is a general perspective view showing an air ship provided with my form of plane, and Figs. 2 and 3 are front and side elevations respectively of the plane.

In the drawings, I have shown all the parts of the air ship, with the exception of the plane, conventionally, and the particu-

lar formation of all of such parts may be variously modified.

Taking up a description of the invention by the use of reference characters, 1 represents any suitable form of car or basket, in which the motor 2 and the passenger or passengers are carried. This motor may be of any practicable type, such as an internal combustion engine.

The car 1 is suspended by suitable cables from the plane of the air ship, said plane, as illustrated, consisting of a flat central or bottom portion 3 and side portions 4, the said side portions being shown as inclined somewhat from the perpendicular to the bottom, such construction forming an open-topped trough. The bottom portion 3 of the trough has its narrowest width at the front end, the drawings showing such portion as gradually widening from the front to the rear, whereby a wedge-shaped trough is produced. The side portions 4 may also increase in depth from the front to the rear; for a purpose hereinafter set forth. The parts of the plane should be rigid with respect to one another and, for this purpose, bars or braces 5 are extended at intervals across from the upper edges of the side portions 4 of the plane. By suspending the car below the plane, stability of the ship is secured, which stability is increased by inclining the side portions outwardly, it being obvious that if the ship in descending should tilt toward one side, that side presents an increasing resistance which has the tendency of righting the ship again.

Journalled in suitable bearings 6 and 7 is the propeller shaft 8, the bearings for the shaft being supported in any suitable manner, as by braces 9 extending from the angles of the trough inwardly and from certain of the cross bars 5 downwardly. The shaft carries a propeller 10 at its rear end, and a sprocket wheel 11 at its front end, said wheel being driven by a chain 12 from the motor 2.

Suitable rudders, not shown, may be provided for directing the course of the ship.

The operation of the device just described is as follows: Any suitable means known in the art may be employed for securing the initial movement of the ship through the air, such means of course being supplemented by the operation of the propeller 10, which is so positioned as to draw the air backwardly out of the trough. When the ship